REMARKS

The Office Action dated April 23, 2008 has been received and carefully noted. The following remarks are submitted as a full and complete response thereto. Claims 1, 2, 5-9, and 12-17 are currently pending in the application and are respectfully submitted for consideration.

The Office Action rejected claims 1-2, 5, 8-9, and 12 under 35 U.S.C. §103(a) as being unpatentable over Pehlke (U.S. Patent Pub. No. 2002/0136325) in view of Hareyama (U.S. Patent No. 6,700,440), and further in view of Gandhi (U.S. Patent No. 6,968,201). The Office Action took the position that Pehlke and Hareyama disclose all of the elements of the claims, with the exception of the instruction specifying at least one of a percentage change in power and a dB change in power. The Office Action then cited Gandhi as allegedly curing this deficiency in Pehlke and Hareyama. This rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claims 2 and 5-7 are dependent, recites a method which includes receiving an instruction to adjust the output power of power amplifier, powering on or off at least one branch of the power amplifier according to the received instruction to enable a logarithmic change in output power of the amplifier, and amplifying a signal according to the adjusted output power. The instruction specifies at least one of a percentage change in power and a dB change in power.

Claim 8 recites a system including means for receiving an instruction to adjust the output power of power amplifier, means for powering on or off at least one branch of the power amplifier according to the received instruction to enable a logarithmic change in output power, and means for amplifying a signal according to the adjusted output power. The instruction specifies at least one of a percentage change in power and a dB change in power.

Claim 9, upon which claims 12-14 are dependent, recites a system including a receiving engine capable of receiving an instruction to adjust the output power of power amplifier, and a determining engine, communicatively coupled to the receiving engine, capable of determining how many branches of a power amplifier to power on or off according to the received instruction to enable a logarithmic change in output power. The system also includes a power amplifier engine, communicatively coupled to the determining engine and the power amplifier, capable of transmitting the determination to the power amplifier. The instruction specifies at least one of a percentage change in power and a dB change in power.

According to certain embodiments of the invention, therefore, a system and method are provided that enable power control capability in a linear power amplifier from a maximum output power to a minimum output power in linear steps of 2dBm there between. Accordingly, power amplifier output power can be adjusted linearly in dB according to power needs, thereby reducing overall power consumption.

As will be discussed below, the combination of Pehlke, Hareyama, and Gandhi fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Pehlke discloses a branched power amplifier circuit that includes two or more amplifier segments or branches, each with a corresponding lossy modulator. The branched power amplifier may be dynamically resized by enabling different ones of its branches, to deliver peak efficiency at a number of different amplifier output power levels. Each amplifier branch operates in a saturated mode and selectively amplifies an RF input signal. The lossy modulators provide either supply voltage or supply current modulation to corresponding amplifier branches, thus imparting highly linear amplitude modulation to the overall output signal generated by branched power amplifier, despite its saturated mode operation.

Hareyama discloses a high-frequency power amplifier system including a plurality of individual amplifiers connected in parallel. The amplifiers include switching-driven FET's. A fixed drain voltage is applied to one amplifier and a variable drain voltage is applied to another amplifier through a section including a DC-DC converter that converts the voltage according to a control value of a control signal. The turning on and off of the operation of the power amplifier is controlled by a control signal. The circuit constants of a matching circuit are variable. In a high output power region, the power amplifier is turned on and, in a low output power region, turned off.

Gandhi discloses a system and method for reverse link power control in a wireless communications network. Power adjust commands are generated for mobiles being served by a network base station in a centralized manner by considering overall system performance when an increased interference condition is detected. In one implementation, a base station power control processor adopts a modified reverse inner loop power control (RILPC) and/or a reverse outer loop power control (ROLPC) algorithm when an increased interference condition is detected. According to the modified RILPC algorithm, a percentage of power-up adjust commands which would normally be generated when E_b/N_o measurements for served mobiles do not meet target E_b/N_o levels are converted to power down-adjust commands, thereby forcing some mobiles to reduce transmit power, at least temporarily, to constrain interference.

Applicants respectfully submit that the combination of Pehlke, Hareyama, and Gandhi fails to disclose or suggest all of the elements of the present claims. For example, Pehlke, Hareyama and Gandhi do not disclose or suggest that the instruction to adjust the output power of power amplifier "specifies at least one of a percentage change in power and a dB change in power," as recited in claims 1, 8, and 9.

According to embodiments of the present invention, a power amplifier control system 285 controls the power amplifier 280 output power based on instructions received from a base station, other wireless node, or other source. For example, if a wireless device incorporating the transmitter section 200 is near a base station (e.g., BS 12), the base station can instruct the power amplifier control system 285 to decrease the output

power on the power amplifier 280, thereby reducing power consumption and reducing interference in any other nearby wireless devices. The power amplifier control system 285 will then instruct the power amplifier 280 to turn off one or more branches to decrease output power. However, if the wireless device incorporating the transmitter section 200 is far away from a base station, the base station can instruct the power amplifier control system 285 to increase the output power of the power amplifier 280 (Specification, paragraph 0028). The instruction from the control system may specify a percentage change in power and/or a dB change in power.

As acknowledged by the Office Action, neither Pehlke nor Hareyama discloses that the instruction to adjust the output power of power amplifier "specifies at least one of a percentage change in power and a dB change in power" (see Office Action, page 3). However, the Office Action cited Gandhi as allegedly curing this deficiency in Pehlke and Hareyama. Applicants respectfully disagree and submit that Gandhi, like Pehlke and Hareyama, fails to disclose "wherein the instruction specifies at least one of a percentage change in power and a dB change in power," as recited in claim 1 and similarly recited in claims 8 and 9.

As outlined above, Gandhi merely discloses that the power control processor converts a percentage of power up-adjust commands to power down-adjust commands to constrain interference at the base station and preserve overall service quality. In other words, to prevent an abrupt increase in the number of power up-adjust commands when E_b/N_o measurements do not meet target levels, Gandhi teaches that a percentage of the

power up-adjust commands which would normally be issued by the base station are converted to power down-adjust commands, thereby forcing some mobiles to reduce transmit power (Gandhi, Column 2, lines 26-49).

Gandhi, however, does not disclose or suggest that the instruction to adjust the output power of the power amplifier specifies at least one of a percentage change in power and a dB change in power, as recited in the present claims. Rather, Gandhi only teaches that "a percentage of the power up-adjust commands which would normally be issued by the base station are converted to power down-adjust commands" (Gandhi, Column 2, lines 42-45). Therefore, Gandhi only refers to a percentage of power up-adjust commands that are changed to power down adjust commands. Gandhi does not disclose or suggest that the instruction specifies a *percentage change in power*. Furthermore, Gandhi makes no mention of a dB change in power. Accordingly, Gandhi, like Pehlke and Hareyama, fails to disclose or suggest that the instruction to adjust the output power of power amplifier "specifies at least one of a percentage change in power and a dB change in power."

For at least the reasons discussed above, Applicants respectfully submit that the combination of Pehlke, Hareyama and Gandhi fails to disclose or suggest "wherein the instruction specifies at least one of a percentage change in power and a dB change in power," as recited in claim 1 and similarly recited in claims 8 and 9. Thus, Applicants respectfully request that the rejection of claims 1, 8 and 9 be withdrawn.

Claims 2, 5, and 12 are dependent upon claims 1 and 9, respectively. Therefore, claims 2, 5, and 12 should be allowed for at least their dependence upon claims 1 and 9, and for the specific limitations recited therein.

Claims 15-17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Pehlke (U.S. Patent Pub. No. 2002/0136325) in view of Hareyama (U.S. Patent No. 6,700,440). The Office Action took the position that Pehlke discloses all of the elements of the claims, with the exception of "a plurality of transistors, each transistor being communicatively coupled to a branch of the plurality of branches, wherein the transistors are arranged in a logarithmic scale, thereby enabling a logarithmic change in output power with the powering on or off of a transistor." The Office Action then cited Hareyama as allegedly curing these deficiencies in Pehlke. This rejection is respectfully traversed for at least the following reasons.

Claim 15, upon which claims 16 and 17 are dependent, is directed to a power amplifier. The power amplifier includes a plurality of branches for controlling transistors, and a plurality of transistors, each transistor being communicatively coupled to a branch of the plurality of branches. The transistors are arranged in a logarithmic scale, thereby enabling a logarithmic change in output power with the powering on or off of a transistor.

Pehlke and Hareyama are outlined above. Applicants submit that Pehlke and Hareyama, whether viewed individually or combined, do not disclose or suggest all of the elements of claims 15-17, as will be discussed below.

Applicants submit that the combination of Pehlke and Hareyama fails to disclose or suggest "wherein the transistors are arranged in a logarithmic scale, thereby enabling a logarithmic change in output power with the powering on or off of a transistor," as recited in claim 15. As illustrated in Fig. 3B, which is a block diagram, the embodiments of the present invention provides the power amplifier 280 as part of the transmitter section 200 (FIG. 2). Each input (In) of the section 280a is communicatively coupled to a transistor of the transistors 280b, which vary in size to enable linear in dB steps in adjust output power levels of the amplifier 280 as shown in Table II of the present specification, where transistors are arranged in a logarithmic scale (See Specification, paragraph 0032).

Applicants respectfully submit that Pehlke and Hareyama fail to disclose or suggest that the transistors are arranged in a logarithmic scale. Pehlke merely discloses that the "lossy modulator 34 includes a control circuit 60, which typically comprises an operational amplifier 64, a current sense resistor 66, a control current source 68, and a signal resistor 70. The lossy modulator 34 further includes the pass transistor 52" (Pehlke, paragraph 0041).

Hareyama only discloses that "[w]hen there is designation of target value for the high output power region, a control signal CONT(2) for operating both the power amplifiers PA(1) 1_1 and PA(2) 1_2 is transmitted from the controller. The switch SW20 is turned off and the switch SW21 is turned on by the control signal CONT(2) to change the power amplifier PA(1) 1_2 to the operation mode thereof. Then, the control signal CONT(2) turns off the switch SW11 so as to make the branch of the capacitor C13 and

the inductor L11 turn to connected mode. Also, the control signal CONT(2) turns off the switch SW12 to cut off the branch of the capacitor C14. Thereby, the circuit constants of the matching circuit 2 are set to meet the matching condition in the case where both the power amplifiers PA(1) 1_1 and PA(2) 1_2 are operated" (Hareyama, Column 5, lines 29-67). Hareyama fails to disclose or suggest that the transistors or switches are arranged in a logarithmic scale. As such, Hareyama fails to cure this deficiency in Pehlke.

Thus, the combination of Pehlke and Hareyama fails to disclose or suggest "wherein the transistors are arranged in a logarithmic scale, thereby enabling a logarithmic change in output power with the powering on or off of a transistor," as recited in claim 15. Applicants respectfully request that the rejection of claim 15 be withdrawn.

Claims 16 and 17 are dependent upon claim 15. Therefore, claims 16 and 17 should be allowed for at least their dependence upon claim 15, and for the specific limitations recited therein.

Claims 6-7 and 13-14 were rejected under 35 U.S.C. §103(a) as being unpatentable over Pehlke, Hareyama and Gandhi, in view of Eidson (U.S. Patent No. 6,255,906). The Office Action took the position that Pehlke, Hareyama, and Gandhi disclose all of the limitations of the claims, with the exception of the thermometer coded power control words. The Office Action then cited Eidson as allegedly curing this deficiency in Pehlke, Hareyama and Gandhi. This rejection is respectfully traversed for the reasons which follow.

Pehlke, Hareyama, and Gandhi are discussed above. Eidson discloses a power amplifier operated as an envelope digital to analog converter with digital predistortion. In order to reproduce a particular envelope profile, a selected number of the power amplifiers of the power amplifier array is switched on, whereas another selected number of the power amplifiers of the power amplifier array are switched off. All elements are fed with an RF signal containing phase information as well. The amplified, output signal provided after the power amplifier array is fed to an antenna for signal transmission. Impedance matching circuitry is employed between the power amplifier array and the antenna to provide efficiency for those applications having low power budgets or seeking to operate with extremely high efficiency.

Claims 6-7 and 13-14 are dependent upon claims 1 and 9, respectively. In addition, as discussed above, Pehlke, Hareyama and Gandhi fail to disclose or suggest all of the elements of claims 1 and 9. Furthermore, Eidson fails to cure these deficiencies in Pehlke, Hareyama and Gandhi, as Eidson also fails to disclose or suggest, at least, "wherein the instruction specifies at least one of a percentage change in power and a dB change in power." Accordingly, the combination of Pehlke, Hareyama, Gandhi and Eidson fails to disclose or suggest all of the elements of claims 6-7 and 13-14. Additionally, claims 6-7 and 13-14 should be allowed for at least their dependence upon claims 1 and 9, and for the specific limitations recited therein.

Applicants respectfully submit that Pehlke, Hareyama, Gandhi and Eidson, whether considered alone or in combination, fail to disclose or suggest all of the elements

of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1, 2, 5-9, and 12-17 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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